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Tuna Newsletter

National Marine Fisheries Service
● Southwest Region
● Southwest Fisheries Science Center

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U.S. TUNA STATISTICS

Editor's note: The following articles were prepared by NMFS personnel from data and information gathered from sources in the U.S. tuna industry.

U.S. CANNED TUNA INDUSTRY HIGHLIGHTS, FIRST QUARTER 1992

Total receipts of tuna by U.S. canners during the first quarter of 1992 (January-March) increased by 7% to the equivalent of 110,500 short tons (st) of whole fish (round weight), compared to the first quarter of 1991 (Table 1). The principal species received was skipjack tuna with 62% of the total, followed by albacore and yellowfin, each with approximately 19% of the total. Skipjack and albacore receipts were up 16% and 12%, respectively, for the quarter, while yellowfin receipts were down 16%. Although the vast majority of tuna received by U.S. canners is whole fish, some quantity of tuna is received as loins or gilled-and-gutted. The ratio of tuna loins to total receipts for the first quarter of 1992 was 10%, unchanged from the previous year. [The round weight totals used above were approximated by converting weights of loins and gilled-and-gutted receipts by factors of 2.25 and 1.11, respectively. For the remainder of this article, unconverted receipts are used unless otherwise stated.]

Receipts of tuna in American Samoa and California for the first quarter of 1992 were up 2%, compared to the first quarter of 1991 (Table 2). Receipts in Puerto Rico were up by 16%, buoyed by substantial increases in skipjack and albacore receipts. Domestic deliveries to canneries were up 8% in American Samoa/California and up over 200% in Puerto Rico. Skipjack was by far the largest component of all domestic deliveries at 32,500 st, followed by yellowfin, 12,100 st, and albacore, 2,300 st. Imports accounted for 52% of the tuna delivered to U.S. canners during the first quarter of the year.

Skipjack was the leading import for the first quarter of 1992 at 25,400

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Table 1. Total U.S. cannery receipts (st) by classification of tuna for the first quarters of 1991 and 1992. Totals may not add due to rounding.

Jan-Mar	Type	Albacore	Skipjack	Yellowfin[1]	TOTAL
1991	ROUND	13,600	45,500	21,600	80,700
	GILLED & GUTTED	0	0	800	800
	LOIN	2,400	6,000	1,200	9,600
	TOTAL (as received)	16,000	51,500	23,600	91,200
	TOTAL (estimated round wt)[2]	19,000	59,100	25,200	103,300
1992	ROUND	21,200	49,500	17,400	88,100
	GILLED & GUTTED	0	0	600	600
	LOIN	0	8,400	1,400	9,700
	TOTAL (as received)	21,200	57,900	19,300	98,300
	TOTAL (estimated round wt)[2]	21,200	68,300	21,100	110,500

[1]May include a small amount of bigeye tuna.

[2]Converted to round weight by using factors of 1.11 for gilled-and-gutted and 2.25 for loins.

Table 2. U.S. cannery receipts (st) of domestic and imported tuna by species for the first quarters of 1991, 1992 and the recent (1987-91) first quarter averages. Totals may not add due to rounding.

Jan-Mar	Source	Albacore	Skipjack	Yellowfin[1]	TOTAL
		AMERICAN SAMOA & CALIFORNIA			
1991	DOMESTIC	3,100	24,900	8,500	36,500
	IMPORTED	7,800	8,500	1,700	17,900
	TOTAL	10,900	33,300	10,200	54,400
1992	DOMESTIC	2,300	26,000	11,000	39,300
	IMPORTED	9,000	5,700	1,500	16,200
	TOTAL	11,300	31,700	12,600	55,500
1987-91 Average	DOMESTIC	1,900	20,400	10,000	32,300
	IMPORTED	6,700	8,100	3,600	18,500
	TOTAL	8,600	28,600	13,600	50,700
		PUERTO RICO			
1991	DOMESTIC	*	1,400	1,100	2,500
	IMPORTED	5,100	16,800	12,400	34,300
	TOTAL	5,100	18,200	13,500	36,800
1992	DOMESTIC	0	6,500	1,100	7,600
	IMPORTED	9,900	19,700	5,600	35,200
	TOTAL	9,900	26,200	6,800	42,800
1987-91 Average	DOMESTIC	*	2,700	13,500	16,200
	IMPORTED	15,300	16,700	11,600	43,500
	TOTAL	15,300	19,400	25,000	59,700
		TOTAL			
1991	DOMESTIC	3,100	26,200	9,600	39,000
	IMPORTED	12,900	25,300	14,000	52,200
	TOTAL	16,000	51,500	23,600	91,200
1992	DOMESTIC	2,300	32,500	12,100	46,900
	IMPORTED	18,800	25,400	7,200	51,400
	TOTAL	21,200	57,900	19,300	98,300
1987-91 Average	DOMESTIC	1,900	23,100	23,500	48,400
	IMPORTED	22,000	24,800	15,100	62,000
	TOTAL	23,900	47,900	38,600	110,400

*Less than 100 st reported for this category.

[1]May include a small amount of bigeye tuna.

st, followed by albacore, 18,800 st, and yellowfin, 7,200 st (Table 3). The leading supplier was Taiwan, with 26% of the import market, followed by Spain and Japan, with 13% and 11% of the import market, respectively. The western Pacific Ocean was the main source of all three important tuna species (Table 4): skipjack (34,400 st), albacore (13,200 st) and yellowfin (12,300 st).

Contract prices for domestically caught tuna delivered to U.S. canners in the first quarter of 1992 were substantially lower than 1991 prices for all categories of fish (Table 5). U.S. imports of canned tuna packed in water totaled 53,600 st for the first quarter of 1992, down 8% from 1991. As of June 21, 1992, imports of canned tuna stood at 98,400 st, up 16% from the previous year.

U.S. TUNA FISHERIES UPDATE

EASTERN PACIFIC PURSE SEINE FISHERY

During the period January through June 1992, 10 U.S. purse

Table 3. U.S. cannery imports (st) of tuna by species1 and source (flag of catcher vessel) for the first quarter of 1992. Totals for the first quarter of 1991 are given for comparison. Note that the flag of the catcher vessel does not necessarily reflect the country of export or point of shipment. Totals may not add due to rounding.

COUNTRY	1992				1991
	ALB	SKJ	YFT[2]	TOTAL	TOTAL
ECUADOR	0	1,100	300	1,400	2,500
FRANCE	0	3,900	1,200	5,100	6,500
GHANA	0	3,000	1,600	4,600	4,700
GRAND CAYMAN	800	0	0	800	0
JAPAN	2,700	2,100	800	5,600	2,000
MALTA	0	1,100	400	1,500	1,500
NEW ZEALAND	1,200	0	0	1,200	300
PANAMA	800	1,500	200	2,500	2,400
SOUTH KOREA	700	800	200	1,700	6,800
SPAIN	200	5,300	1,200	6,700	9,500
TAIWAN	12,000	1,100	500	13,500	9,700
U.S.A.	300	2,100	100	2,400	900
VANUATU	0	2,500	400	2,800	1,400
OTHER	200	1,100	400	1,700	4,100
UNKNOWN	*	0	*	*	0
TOTAL (as received)	18,800	25,400	7,200	51,400	52,200
TOTAL (estimated rnd wt)[3]	18,800	35,800	8,900	63,600	63,200

*Less than 100 st reported for this category.

[1]ALB=albacore; SKJ=skipjack; YFT=yellowfin.

[2]May include a small amount of bigeye tuna.

[3]Converted to round weight by using factors of 1.11 for gilled-and-gutted and 2.25 for loins.

seiners caught an estimated 9,500 metric tons (mt) of yellowfin tuna and 7,100 mt of skipjack tuna in the eastern tropical Pacific (Figure 1). The yellowfin catch was down 17% from the 1991 catch (11,500 mt), while the skipjack catch was up 31% from the 1991 catch (5,400 mt). The fleet continues to be effected by "dolphin safe" policies and is concentrating its effort on skipjack and yellowfin not associated with dolphins.

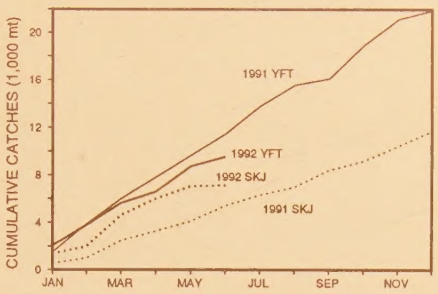

Figure 1. Cumulative tuna catches, by month, for the U.S. eastern Pacific purse seine fishery, 1991 and 1992.

Table 4. Receipts (st) of tuna by U.S. canneries by species[1] and area of capture for the first quarters of 1991 and 1992. Totals may not add due to rounding.

SOURCE	1991			1992		
	ALB	SKJ	YFT[2]	ALB	SKJ	YFT2
E. ATLANTIC OCEAN						
DOMESTIC	0	0	0	0	0	0
IMPORTED	3,800	15,100	6,800	2,100	15,700	4,800
TOTAL	3,800	15,100	6,800	2,100	15,700	4,800
W. ATLANTIC OCEAN						
DOMESTIC	*	0	0	0	0	0
IMPORTED	1,300	0	100	2,600	0	*
TOTAL	1,300	0	100	2,600	0	0
E. PACIFIC OCEAN						
DOMESTIC	0	3,400	3,300	*	2,700	800
IMPORTED	0	1,700	2,300	0	2,300	300
TOTAL	0	5,100	5,600	0	5,000	1,100
W. PACIFIC OCEAN						
DOMESTIC	3,100	22,900	6,300	2,300	29,800	11,300
IMPORTED	6,800	6,600	1,700	10,900	4,700	1,000
TOTAL	9,900	29,500	7,900	13,200	34,400	12,300
INDIAN OCEAN						
DOMESTIC	0	0	0	0	0	0
IMPORTED	1,000	1,900	3,200	3,200	2,700	1,100
TOTAL	1,000	1,900	3,200	3,200	2,700	1,100

*Less than 100 st reported for this category.

[1]ALB=albacore; SKJ=skipjack; YFT=yellowfin.

[2]May include a small amount of bigeye tuna.

Table 5. Contract price ranges (U.S. $ per st) for skipjack and yellowfin tuna for delivery to U.S. canneries in American Samoa and Puerto Rico by U.S. vessels arriving from trips in first quarter 1991 and 1992.

SIZE CLASS (lbs.)	SKIPJACK		YELLOWFIN	
	1991	1992	1991	1992
<3	420-460	250-340	420-460	250-340
3 to 4	620-660	450-540	620-660	450-540
4 to 7.5	820-855	645-735	820-855	645-735
7.5 to 20	895-920	710-795	910-930	720-795
>20	---	---	985	810-860

WESTERN PACIFIC PURSE SEINE FISHERY

During the period January through May 1992, 37 U.S. purse seiners landed an estimated 36,600 mt of skipjack tuna and 17,600 mt of yellowfin tuna in the western Pacific (Figure 2). The skipjack landings were down 30% from the 1991 landings (52,100 mt) and the yellowfin landings were down 26% from the 1991 landings (23,800 mt). The numbers for 1992 may be depressed substantially because of late reports due to the transshipment of catches.

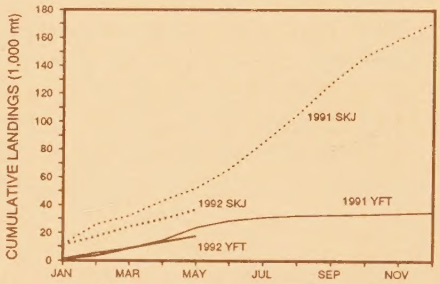

Figure 2. Cumulative tuna landings, by month, for the U.S. western Pacific purse seine fishery, 1990 and 1991.

NORTHERN PACIFIC ALBACORE FISHERY

The 1992 U.S. fishery began in late June with troll vessels departing from the West Coast and the Hawaiian Islands. In early July albacore were caught in large numbers (up to 500 fish per day) roughly 2,600 miles west of Cape Mendocino, in moderate numbers (up to 300 fish per day, but averaging 125 fish per day) approximately 1,000 miles west of San Francisco, and in smaller numbers (up to 80 fish per day) about 500 miles west of San Francisco. Fish sizes reported thus far are small, averaging 12 pounds.

SOUTHERN PACIFIC ALBACORE FISHERY

The 1991-92 south Pacific albacore troll season ran from December

1991 through April 1992. Approximately 3,700 mt were landed in various south Pacific ports and in southern California by a fleet of 65 vessels, mostly U.S. but including New Zealand and French Polynesia registered vessels as well. The 1991-92 catch is just over half of the amount landed by 72 vessels in 1990-91.

ATLANTIC BLUEFIN TUNA FISHERY

The U.S. Atlantic bluefin tuna fishery is regulated with an ICCAT annual catch quota of 1,387 mt. As of July 1, the total commercial landing for 1992 stood at 131 mt, down 30% from the 1991 commercial landing (188 mt) for the same period. The incidental longline category south of 36°N latitude closed on 10 April on the determination that the annual quota for that category would be reached.

HAWAII TUNA FISHERY

In 1991, commercial landings of tuna in Hawaii totaled 4,605 mt with an ex-vessel value of $23.8 million (Figures 3 and 4). This represents a 19% increase in weight but only a 6% increase in revenue from 1990 landings. Tunas represent 45% of total pelagic revenue, with longline landings of swordfish (4,350 mt, $21 million) comprising the largest single component of the pelagic fishery. The overall pelagic fishery, including tunas, billfish, swordfish, mahimahi, ono (wahoo) and miscellaneous pelagics, increased by 35% in revenue with longline revenues increasing by 38%.

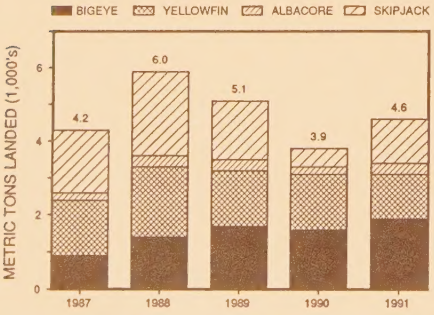

Figure 3. Commercial tuna landings in Hawaii, by species, for 1987 to 1991.

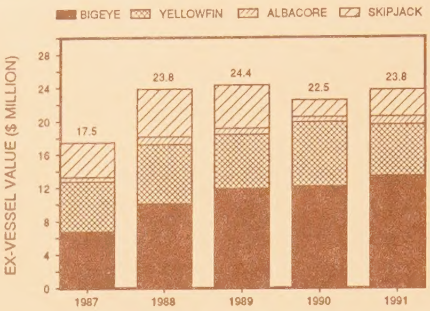

Figure 4. Ex-vessel value of tuna landings in Hawaii, by species, for 1987 to 1991.

Bigeye was the most important component of the tuna landings, 1,900 mt valued at $13.4 million. Yellowfin landings were 1,200 mt valued at $6.2 million and skipjack tuna landings were 1,160 mt valued at $3.3 million. The 1991 commercial pelagics fleet consisted of 115 active longliners, 5 pole-and-line skipjack boats, and approximately 500 commercial pelagic trollers (including charter boats) and handliners. *(Report prepared by Samuel Pooley, NMFS Southwest Fisheries Science Center, Honolulu, HI)*

Gary Rensink and John Childers, SWFSC, and Dick Seamans, NMFS Northeast Region, contributed information for this article on fisheries update.

REPORTS

Editor's note: Original reports are published as a service to subscribers and may not represent the views of the NMFS. Readers should contact the authors of reports for details, if needed.

WHEN DO YELLOWFIN TUNA EAT?

Sofía Ortega García, Felipe Galván Magaña and Joaquín Arvizu Martínez, Centro Interdisciplinario de Ciencias Marinas, Apartado Postal 592, La Paz, Baja California Sur, Mexico

Studies on the feeding habits of yellowfin tuna mainly deal with the volume and species that serve as food. However, the daily variations in the feeding habits of this species are not known. To determine when the yellowfin tuna eat and what they eat, the Interdisciplinary Center of Marine Sciences in La Paz, Baja California Sur, Mexico, performed a study analyzing the fishing logbooks of the Mexican purse seine fleet and taking stomach contents from tuna samples from sets made during 1985 in the Mexican economic zone (Figure 5).

Figure 5. Geographic location of the sets on yellowfin tuna from which the stomach samples were obtained.

We determined that most of the 6,322 sets were carried out during daylight hours (98%), clustered around two points with two maximal points, one in the morning (from 8:00 to 11:00 hours) and the other in the afternoon (from 15:00 to 17:00) with a minimum of sets between 12:00 to 14:00 hours.

Although some studies of the feeding habits of tunas have demonstrated that they eat during almost all times of the 24-hour day, our analysis of 402 stomachs showed two peaks of full stomachs (Figure 6). The first occurs during the morning from 10:00 to 11:00 and the second one in the afternoon at 17:00 with a minimum from 12:00 to 14:00 hours. We found that the hours when most tuna had empty stomach were almost the same hours during which the Mexican purse seine fleet made the least number of sets.

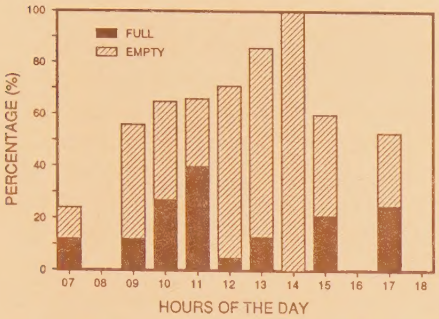

Figure 6. Daily cycle of the amount of food found in the stomachs of captured specimens.

Such information could be useful to bait boat fishermen because this indicates that at these hours tuna are looking for food.

In terms of the food species identified, 23 species were recorded at the mouth of the Gulf of California, 19 in the Revillagigedo Archipelago and 15 in the waters south of the Gulf of Tehuantepec. However, the predominant species for each area are different. It was found that young tuna prefer small prey species, such as red crab and anchovy which are abundant off the western coast of the Peninsula of Baja California.

Bigger tuna feed preferably on bigger prey, like the bullet mackerel, *Auxis rochei*, which is abundant off the south of Mexico, in the Gulf of Tehuantepec. A species eaten by tuna during the night is squid, which thrives throughout the Mexican Pacific all year round. It is thus the most available food for the tuna. This confirms that the yellowfin tuna is an opportunistic and impartial organism where its food is concerned.

An abstract from a recently published paper written by a SWFSC scientist is also presented in this space as an example of the tuna research conducted at the Center.

SWFSC PUBLICATION: "POLYSPECIFIC NATURE OF TUNA SCHOOLS: SHARK, DOLPHIN, AND SEABIRD ASSOCIATES"

David W. Au, La Jolla Laboratory, Southwest Fisheries Science Center, National Marine Fisheries Service, NOAA, P.O. Box 271, La Jolla, California 92038. Published in Fishery Bulletin, U.S. 89:343-354 (1991)

Yellowfin tuna *Thunnus albacares* are commonly found associated with other species, especially sharks, birds, and dolphins, in the eastern tropical Pacific. Data from the purse seine fishery there, collected during 1974 and 1975, indicate that sharks occurred with tuna in 40% or more of the purse seine sets made around floating logs. Most other species, including rays, billfish, and small tunas, usually occurred in less than 10% of the sets. The association rate of these bycatch species declined progressively from log- to school- to porpoise-associated sets. This, together with their behavior as understood, suggests that at least some of these species stay with the tuna as much as they can. Such behavior would be like that of polyspecific associations in which two or more species travel together for foraging and protective advantages.

RECENT DEVELOPMENTS IN TUNA FISHERIES

Editor's note: The following news items, compiled from fishery trade and industry journals, newspapers and NMFS reports, are provided only as a service to our readers. The NMFS does not guarantee their accuracy.

UNITED STATES

NMFS Announces Daily Catch Limit Reduction for Atlantic Bluefin–The National Marines Fisheries Service has announced a reduction in the daily catch limit for the *angling* category in the Atlantic bluefin tuna fishery. To lengthen the season, NMFS has reduced the limit from two to one tuna per person for fish less than 77 inches (school bluefin) and reduced the daily vessel limit for medium Atlantic bluefin tuna from two to one per day. This adjustment will remain in effect until additional adjustments become necessary. The fishery is monitored daily and the decision to reduce the daily catch limit is based on reported landings and catch rates for Atlantic bluefin tuna to date in the *angling* category. *(NMFS Fisheries Market News Report, June 29, 1992)*

Swim Tunnel Tuna Study–Scientists are using a swim tunnel to study tuna in captivity, according to George Boehlert, director of the National Marine Fisheries Service's Honolulu Laboratory. The swim tunnel adds a new dimension to tuna research: it allows scientists to monitor the performance of individual tuna during experiments lasting more than 35 hours. Previously, tuna could be monitored for only a few hours before they died. The tunnel has a four-foot long sealed box where a fish can swim freely while it is being studied. Seawater is recirculated through the box via large plastic pipes extending from either end, the flow being controlled by an electric motor and a propeller. The swim tunnel is similar to a treadmill, for the tuna swim against the flowing current within the sealed box. This enables scientists to measure how well tuna perform at different swimming speeds, temperatures and oxygen levels. Like sharks, tuna must swim continuously, for they obtain oxygen by

holding their mouths open as they swim, so that water passes over their gills. They will sink and suffocate if they stop swimming. (*Fishing News International*, June 1992)

Hawaii Longliners Fish 12 Million Hooks– Some 140 longline vessels were active in Hawaii in 1991. They made 1,666 trips and set 12.2 million hooks, according to the National Marine Fisheries Service. Broadbill swordfish made up the largest component of the landings in 1991 with 61,000 fish caught, followed by bigeye tuna (39,500) and mahimahi (38,000). Sharks (71,000) constituted the largest component of the catch, but relatively few were kept (4,500). About half the fishing effort was within the 200-mile zone of the main Hawaiian Islands, where bigeye tuna made up the largest portion of the landings. About one-third of the effort was outside Hawaii's EEZ, with most landings being broadbill swordfish. Average weights, obtained from dockside and wholesale market monitoring in Honolulu, suggest that landings of broadbill swordfish more than doubled in 1991 to about 8.7 million pounds round weight. Landings of bigeye tuna (3.4 million pounds) were about the same as during the previous year, while landings of yellowfin tuna (1.5 million pounds) were down substantially. (*Fishing News International*, June 1992)

WESTERN PACIFIC OCEAN

Yellowfin Price Plunges in Taiwan–A U.S. ban on imports of yellowfin tuna from 20 countries, including the Republic of China, has sent prices plummeting in Taiwan. Since the January 31, 1992, implementation of the ban, which is intended to restrict imports from countries that buy yellowfin from Mexico or Venezuela, the price Taiwan boats receive has plunged from $1,200 per metric ton to less than $600. (*Fishing News International*, May 1992)

New Tuna Port for the Philippines–General Santos City in Mindinao, southern Philippines, has become the country's tuna capital and is having a port built. About 300 tons of tuna is landed daily at the city, some for export as frozen fish and the rest for local processing and sales. There are five large processors in General Santos City. New fishing port facilities are expected to enhance the local tuna processing industry. With the new facilities, foreign fishing companies catching in the Pacific and landing in Thailand could switch to General Santos City. (*Fishing News International*, May 1992)

Papua New Guinea Licenses Gillnetters– A Taiwanese fishing vessel has been granted a one-year license for gill net fishing in the waters of the Gulf of Papua, off Papua New Guinea. The license was issued by the government despite strong objections from senior fisheries officials. The vessel is reported to use nets measuring 10 to 20 kilometers long, with six-inch mesh. The 25-plus crew on board is mostly Taiwanese, but includes three Papua New Guineans. (*Fishing News International*, June 1992)

Three-Country Southern Bluefin Tuna Watch–First moves to conserve depleted stocks of the highly-valued southern bluefin tuna have been made. A New Zealand fisheries observer has joined the Japanese longliner *Hoshin Maru 58* for up to 90 days as the vessel works grounds in the Southern Ocean and as far as the East Cape. This is the first of three New Zealand Ministry of Fisheries observers to join the "real time monitoring program," which has been organized by the three main southern bluefin tuna fishing nations: New Zealand, Japan and Australia. "The main aim is to ensure that comprehensive information on southern bluefin tuna is collected at sea and relayed as fast as possible to scientists on land," said Dr. John McKoy, the ministry's marine research manager. There is mounting concern about depleted stocks. High quality, up-to-date information is urgently needed for conservation and management decisions, according to McKoy. Selected vessels in the Japanese bluefin fleet are sending daily reports of their catches for scientists based in the three catching countries. Such information includes length and weight of the species, as well as details of by-catch. (*Fishing News International*, May 1992)

Japan Farms Bluefin Tuna– The *Japan Times* reports that the Fisheries Agency of Japan was to have launched an experiment in June 1992 to farm bluefin tuna in a large fish preserve. The 4-year project will cost an estimated $3 million and will be conducted by Marino-Forum 21, an affiliate of FAJ; private companies will be asked to contribute. The goal is to develop bluefin farming to offset increasing tuna prices resulting from both declining tuna imports and decreasing domestic tuna catch (down over 60% from 58,000 tons in 1980 to only 20,000 tons in 1990.) Young tuna, weighing from 2-3 kg, will be used in the experiment to develop a viable commercial tuna farm where fish can be grown to a length of about 1 meter. At present, insufficient knowledge exists to raise tuna from eggs. An important problem researchers will face is developing a system that can keep the high-speed tuna from smashing into barrier nets, as nearly 40% of cultured tuna perish this way. (NMFS Office of Foreign Affairs, *Weekly Highlights*, May 11-15, 1992)

New Zealand to Raise Bluefin Tuna–New Zealand's Marlborough Sounds is set to become a tuna fattening site. Applications have been made to fatten bluefin tuna in sea cages on a three-hectare marine farm at Admiralty Bay. Charles Hufflett, managing director of Solander Fisheries, said he and his partners

were looking at the viability of flying live bluefin tuna caught off the west coast--hundreds of kilometers to the south--to Admiralty Bay. There they would be fattened on live fish before being sent to Japan. Plans for up to six cages to hold live bait fish and for cages 33 meters in diameter for rearing bluefin tuna have been drawn up. Hufflett says bluefin tuna ranging from 12 to 20 kg have been successfully reared in cages in South Australia. It was not known, however, how larger tuna would react in a confined environment. (*Fishing News International*, June 1992)

Japanese Farmed Yellowfin Tuna--The Japanese Government announced on June 1, 1992, that yellowfin tuna have successfully spawned for the first time at the National Sea-Farming Center located at Yaeyama, Okinawa Prefecture. Center researchers are applying yellowfin culture techniques to cultured bluefin in the hope of repeating the yellowfin success. The bluefin's larger size and slower rate of maturity, however, have made spawning in captivity difficult. The yellowfin fry were spawned by 3- and 6-year old females in early May 1992. As of June 1, 1992, of the original 8,500 fry (4-4.5 millimeters), only 70 survived. (NMFS Office of Foreign Affairs, *Weekly Highlights*, June 8-12, 1992)

EASTERN PACIFIC OCEAN

IATTC and Tuna-Dolphin Issues--The Annual Meeting of the Inter-American Tropical Tuna Commission was held in La Jolla, California, on June 16-18, 1992. All member countries of the Commission--Costa Rica, France, Japan, Nicaragua, Panama, the United States, Vanuatu and Venezuela--were represented at the meeting. Mexico, Colombia and Ecuador, as well as a number of other countries interested in the eastern Pacific Ocean (EPO) tropical tuna fisheries, also participated in the meeting, and observers were present from both environmental and industry organizations.

The governments participating in the EPO fishery agreed on a mechanism to implement a resolution adopted during a special IATTC meeting two months earlier to progressively reduce dolphin mortality in the EPO tuna purse seine fishery to levels approaching zero through the setting of annual limits. That resolution sets a dolphin mortality limit on the international tuna fleet in the EPO at 19,500 for 1993, which would be lowered over a 7-year period to less than 5,000 in 1999.

Compliance with the new program will be accomplished through the implementation of individual vessel quotas or DMLs (dolphin mortality limits). To monitor vessel compliance with the new program's DMLs, a review panel was established, comprised of government representatives of Colombia, Mexico, Vanuatu, Venezuela and the United States. The panel will also include two fishing industry and two environmental representatives, who shall be non-voting members and selected by the government representatives. In addition, a scientific advisory board was also established to assist the IATTC in research matters pertaining to (1) modifications of purse seine gear to reduce dolphin mortalities and (2) alternative means of catching large yellowfin tuna. The new program was memorialized in both an IATTC resolution and an intergovernmental understanding (to accommodate nonmember countries). (NMFS Office of Foreign Affairs, *Weekly Highlights*, June 15-19, 1992)

WESTERN ATLANTIC OCEAN

British Researchers Report Dolphin Friendly Nets-- Researchers at the Loughborough University of Technology have addressed the problem of incidental dolphin mortalities in fishing nets. Some nets used by British fishermen have such fine mesh that they are acoustically invisible to dolphins. As a result, such nets cause elevated dolphin mortalities. The LUT researchers devised reflectors that

1992 TUNA MEETINGS

(Organizer; meeting type: sci=science, adm=administration)

- SEP 1-4. Fifth Southeast Asian Tuna Conference. General Santos, Philippines. (Indo-Pacific Tuna Development and Management Programme; sci)
- SEP 17-23. Second General Fisheries Council for the Mediterranean Sea (GFCM-FAO)/International Commission for the Conservation of Atlantic Tunas (ICCAT) Expert Consultation on Stock Assessment of Large Pelagic Fishes in the Mediterranean Sea. Heraklion, Crete, Greece. (ICCAT; sci)
- SEP 22-29. Atlantic Swordfish Stock Assessment Workshop. Madrid, Spain. (ICCAT; sci)
- SEP 28-Oct 3. Swordfish Stock Assessment Workshop. Madrid, Spain. (ICCAT; sci)
- OCT 13-16 Atlantic Albacore Stock Assessment Workshop. Madrid, Spain. (ICCAT; sci)
- OCT 26-30. East Atlantic Bluefin Stock Assessment Workshop. Madrid, Spain. (ICCAT; sci)
- NOV 2-6. Standing Committee on Research and Statistics (SCRS) ICCAT Plenary Sessions. Madrid, Spain. (ICCAT; sci)
- NOV 9-13. 8th Special Meeting of ICCAT. Madrid, Spain. (ICCAT; adm)

can be attached to the nets. A tame bottlenose dolphin was studied to produce an acceptable reflector. Preliminary field tests in the Moray Firth showed that the dolphins avoided the nets with reflectors and the researchers are now preparing more elaborate tests. Their work is now focusing on devising an effective reflector that can be attached to the nets at minimal cost. (NMFS Office of Foreign Affairs, *Weekly Highlights*, April 20-24, 1992)

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